appearing from the south, swarms not large; Winnemucca, Nev., 24th, myriads appeared in Paridise valley, 20 miles NNE. of station, considerably damaging crops. Brackettville, Tex., 31st, 8 p. m., small black, hard-shelled bugs, resembling flying ant, appeared in such numbers as to make it impossible to stay within doors; at 9 p. m. had to close office in consequence.

Polar Bands.—Maine, 16th, 24th, 25th, 31st; Connecticut, 8th; New Jersey, 7th, 19th, 27th; Virginia, 27th; Indiana, 6th, 19th, 22nd, 24th, 31st; Iowa, 2nd, 3rd, 6th, 13th, 15th, 22nd, 31st; Louisiana, 4th; Nebraska, 5th; Dakota, 27th.

Prairie and Forest Fires.—23rd.; Ft. Union, N. M.; 29th., near Wareham, Mass., extensive forest fires; 31st., Bismarck, Dak.

Meteors.—Madison Barracks, N. Y., 27th; Judsonia, Ark., 6th, 9th, 19th; Southington, Conn., 6th; Mayport, Fla., 28th; Anna, Ill., 28th; Como, Ill., 26th; Iowa City, Iowa, 4th; Near Woodstock, Md., 1st, 5th, 6th, 10th, 18th, 21st, 23d, 29th; Rowe, Mass., 2d, 5th, 18th, 23d, 31st; Lebanon, Mo., 28th; Clear Creek, Neb., 25th; Atco, N. J., 26th, 29th; Hector, N. Y., 16th, 8.00 p. m., brilliant meteor moved from W. to E., light very intense, appeared as large as full moon, with train about four times its own diameter; Waterburg, N. Y., 2d, 5th, 23d; Wappingers Falls, N. J., 28th; Fayetteville, N. C., 23d; Cincinnati, Ohio, 27th; Hulmersville, Pa., 10th; Green Castle, Pa., 5th; Aiken, S. C., 25th; Dodge City, Kan., 17th; Davenport, Iowa, 21st, (during bright moonlight); Ft. Whipple, Va., 10th, 8.14½ p. m., brilliant meteor in the east alt. 25°, leaving train of greenish hue; Baltimore, Md., 10th, 8.15 p. m., brilliant meteor in the SE., alt. 35°, bright greenish color, exploded like a rocket, leaving train visible several seconds. Tucson, Arizona, 30th, 10:20 a. m., a large meteor fell at base of mountains, ten miles NE of station, leaving train one mile in length; on striking ground a large volume of smoke ascended, which was plainly visible for 10 or 15 seconds.

Zodiacal Light.—Daytona, Fla., 1st to 3rd; 22nd to 24th; 28th to 31st; Monticello, Iowa., 2nd, 4th, 20th, 24th; Clear Creek, Neb., 19th; Atco, N. J., 1st to 3rd; Bellefontaine, Ohio., 22nd; Wytheville, Va., 1st, 29th, 30th.

Earthquakes.—Steamer "Australia" (at San Francisco, May 22nd, from Sydney,) reports heavy earthquakes at Tanna, in the New Hebrides; land rose twenty feet; harbor seriously injured. February 23rd, at Japan; shock lasting one minute; houses rocked. April 12th or 14th, at 8:30 p. m., a severe earthquake occurred in Venezuela, destroying the town of Cua, in the valley of the Tuy, about thirty miles from Caracas, and burying, at least, three hundred persons; the shock was felt at Caracas, and shocks also continued to be felt until May 4th; about the 19th a portion of the town of Ocumare, 20 miles east of Cua, was thrown down; and on the 29th shocks were felt at Laguayra, Caracas, Porto Cabella and Valencia; 28th, U. S. Naval Hospital, Yokohama, Japan, slight shock. May 8th, Sacramento, Cal., 8:25 p. m., shock from N to S, clocks stopped, pictures shook; also reported to have been felt in Colusa and Mendocino Cos." Red Bluff, 8:25 p. m., "vibration N to S, lasting 10 to 15 seconds, clocks stopped, &c." 10th, U. S. Naval Hospital, Yokohama, Japan, at 9:10 p. m., slight shock. 11th, U. S. Naval Hospital, Yokohama, Japan, 7:40 a. m., slight shock.

Sunsets.—The characteristics of the sky as indicative of fair or foul weather for the succeeding twenty-four hours have been obtained at all Signal Service stations. Reports from 104 stations show 3,210 observations to have been taken; of these 52 were reported doubtful; 2,543 cases, or 79.2 per cent., were followed by the expected weather, and 667 were not.

SOLAR PHENOMENA.

Sun spots.—The following observations, made by Mr. D. P. Todd, have been forwarded by Rear Admiral John Rogers, U. S. N., Superintendent of the U. S. Naval Observatory, Washington, D. C.:

May, 1878.	No. of new—		Disappeared by solar rotation.		Reappeared by solar rotation.		Total number visible.		Remarks.
	Groups	Spots.	Groups	Spots.	Groups	Spots.	Groups	Spots.	
2nd, 10 a. m...	1	1	0	0	0	0	1	1	Large group of faculæ.
12 m...	0	1	0	0	0	0	1	2	
2 p. m...	0	0	0	0	0	0	1	2	
3rd, 10 a. m...	0	0	0	0	0	0	0	0	Faculæ and veiled spots.
4th, 12 m...	0	0	0	0	0	0	0	0	Veiled spots.
7th, 4 p. m...	0	0	0	0	0	0	0	0	Veiled spots and faculæ.
5 p. m...	0	0	0	0	0	0	0	0	
10th, 12 m...	1	2	0	0	0	0	1	2	
2 p. m...	0	0	0	0	0	0	1	2	
21st, 10 a. m...	1	1	0	0	0	0	1	1	
1 p. m...	0	0	0	0	0	0	1	1	
22nd, 12 m...	0	0	0	0	0	0	0	0	Veiled spots.
25th, 3 p. m...	2	3	0	0	—	—	2	3	Brilliant faculæ.
27th, 11 a. m...	0	10	0	0	0	10	2	13	
28th, 11 a. m...	0	5	0	0	0	0	2	18	
5 p. m...	0	0	0	0	0	0	2	18	
29th, 2 p. m ..	0	0	0	0	0	0	2	18	

None visible on the 1st at 11 a. m. and 4 p. m.; 3rd, 1 p. m.; 5th, 3 p. m.; 6th, all day; 8th, 1 p. m.; 11th, 11 a. m.; 13th, 12 m.; 16th, 11 a. m.; 18th, 10 a. m., and 23rd, 11 a. m. The spots visible on the 29th were recorded by the Signal Service Observer at Fort Whipple, Va., as also visible on the 30th, 10 a. m.; and at Portsmouth, N. C., where they continued visible until June 2nd.

Prof. G. Hinrichs, Iowa City, Iowa, reports: none seen 3rd, 4th, 5th, 6th, 8th, 9th, 10th, 12th, 14th 15th, 19th, 21st, 23rd, 24th; 26th and 27th, one group of two spots; 28th, two groups of six spots. Big spot of 30th very remarkable; no penumbra proper visible, but an apparent depression of photosphere; depression sharply defined, large spot in centre and two smaller on margin. These spots had almost disappeared on June 4th.

Observations of the Transit of Mercury, May 6th, 1878, by Signal Service Assistants and Observers.—The following observations of the Transit of Mercury were made by the observers and officers of the Signal Service, in accordance with special order and instructions: In all cases the observations were made by observing an image of the sun of from two to three inches in diameter, as cast by a field glass of two inches aperture and erecting eye piece upon a sheet of white paper, held by means of a suitable frame work, ten or fifteen inches behind the ocular. The watch-times were reduced to Washington Observatory time by means of corrections afforded by the regular telegraphic noonday signals, sent from the observatory over Western Union lines. The predicted chances of fair observing weather agree well with the actual event; for out of fourteen stations, three were wholly unsuccessful and four partly unsuccessful, owing to cloudiness, whence it is fair to estimate that $\frac{3+\frac{1}{2}.4}{14} = 36$ per cent. of the observations were lost through cloudiness. The corresponding predictions, as given in the fourth column, average 60 per cent. successful, or 40 per cent. lost through cloudiness.

Observations of the Transit of Mercury, May 6, 1878, as reported to the Chief Signal Officer.

Station.	Longitude.	Latitude.	Predicted change for fair weather.	Contacts in Washington Time.				Letter No.	Remarks.
			0–10.	1.	2.	3.	4.		
Virginia City	+35° 0′	45° 20′	5	Obscured.	Obscured.	Obscured.	Obscured.	2779	
Denver	25° 1′	39° 45′	3	Obscured.	Obscured.	Obscured	Obscured.	2633	
Pike's Peak	27° 58′	38° 48′	3	Obscured.	Obscured.	Obscured.	Obscured.	2780	
Fort Richardson	21° 7′	33° 12′	5						
				H. M. S.	H. M. S.	H. M. S.			
Sandy Hook	— 3° 2′	48° 28′	7	Missed.	10, 8, 50.	5, 33, 21.	5, 35, 44.	2525	Planet half-way on, 10h. 7m. 38s.
Barnegat	— 2° 54′	39° 48′	7	Missed.	10, 8, 27.	Obscured.	Obscured.	2688	Planet ⅓ on at 10h. 5h. 22s.
Atlantic City	— 2° 38′	32° 22′	7	Obscured.	Obscured.	5, 32, 45.	5, 35, 35.	2524 2904	
Cape May	— 2° 5′	38° 56′	7	Missed.	10, 8, 37.	5, 33, 30.	5, 36, 12.	2781	Planet first seen at 10h. 6m. 48s.
Washington	0° 0′	38° 54′	7	Missed.	10, 7, 2[illegible].	5, 33, 9.	5, 36, 14.	832 misc.	Planet { well on at 10h. 6m. 0s. on full diam. 10h. 9m. 16s. half-way off, 5h. 34m. 44s.
Fort Whipple	+ 0° 1′	38° 50′	7	Missed.	10, 7, 13.	5, 31, 48.	5, 36, 3.	2509 2870	
Cape Henry	— 1° 3′	36° 56′	7	Missed.	Missed.	Obscured.	Obscured.	2598	Record unintelligible.
Norfolk	— 0° 44′	36° 51′	7	Missed.	Missed.	5, 35, 10.	5, 37, 53.	2565	Unsatisfactorily, through clouds.
Cape Hatteras	— 1° 33′	35° 14′	7					3198	Planet not seen.
Cape Lookout	— 0° 33′	34° 36′	7	Instruc	tions re	ceived too	late.	2973	
Wilmington	+ 1° 7′	34° 11′	7	Missed.	Missed.	5, 29, 32.	5, 36, 22.	2738 2948	[Should not 29m. be 34m.?]
Smithville	+ 0° 58′	33° 51′	7	Obscured.	Obscured.	5, 32*, 15.	6, 34*, 18.	2564	Should probably be 33m. & 35m.
Portsmouth, N. C*	— 0° 30′	36° 30′	7	*	*	*	*	2737	
Col. College, Colorado Springs	+27° 46′	38° 50′	3	Missed.	Missed.	5, 32, 56-2.	5, 36, 40-3.	900 misc.	

*Portsmouth observed the contacts at "Watch Time," 10h. 6m. 30s.; 10h. 9m. 40s.; 5h. 38m. 50s; 5h. 43m. 0s., respectively; but not having received Washington telegraphic time-signals, those times cannot be reduced to the common standard.

NOTES AND EXTRACTS.

The following remarks by Hon. A. H. Stephens, of Georgia, as published in the Congressional Record, of June 12th, will be of interest to the observers co-operating with the Signal Service. The subject of the Signal Service being under discussion, Mr. Stephens, of Georgia, said:

"I move to amend the pending paragraph by striking out $325,000 and inserting $350,000. I do not desire to detain the House at all, but I think this is one of the most important branches of the public service. I learn from General Myer, who is in charge of this service, that if $350,000 be now appropriated he can extend this service very considerably, far beyond the ratio of the additional amount, compared with the $300,000, the gross sum appropriated last year. He clearly explained how this could be done. I give an illustration which, I think, clearly presents his idea: It is just as if you had $300,000 invested in a factory with the steam-power or water-power already supplied sufficient to turn four times the machinery in use, and all that would be necessary to add to its efficiency would be the cost of the bands to set additional necessary machinery in motion. Thus $25,000 additional to the amount in the bill, he assured me, would enable him so to extend the utility of the system now in operation. The House can readily, I think, understand the illustration. He ran the system with $300,000 last year, but with $350,000 he could set on one-fourth more bands to other machinery, if you please. The committee have allowed $25,000 additional. That is good as far as it goes, but $25,000 more will double the efficiency of that increase.